

**REMARKS**

At the outset, the Examiner is thanked for the thorough review and consideration of the pending application. The Office Action dated January 11, 2010 has been received and its contents carefully reviewed.

Claims 2, 3, 6, 11, 13, 15 and 19-21 have been amended. Claims 22-26 have been added. Support for these amendments may be found at least at, for example, ¶ [0025], [0027], [0028], [0030] and [0045]-[0051] of the Specification as originally filed. Thus, no new matter has been added. Claims 4, 5, 7, 8, 12, 14 and 16 have been canceled and claim 1 has been previously canceled. Accordingly, claims 2, 3, 6, 9-11, 13, 15, 17, 19-26 are currently pending. Reexamination and reconsideration of the pending claims are respectfully requested.

The Office Action rejects claims 2-17 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,217,333 to Loblich (hereinafter "*Loblich*"). Claims 4, 5, 7, 8, 12, 14 and 16 have been canceled and thus, the rejection with respect to these claims is now moot. As to the remaining claims, Applicants respectfully traverse this rejection.

In order to establish *prima facie* obviousness of a claimed invention, all the claim elements must be taught or suggested by the prior art. *Loblich* does not teach or suggest each and every elements recited in claims 2, 3, 6, 9-11, 13, 15 and 17. Thus *Loblich* cannot render these claims obvious.

Amended claim 2 recites "a KMgPO<sub>4</sub> catalyst supported on a carrier...obtained by sintering KMgPO<sub>4</sub> and the carrier under 1,000-1,400 °C for 22-26 hours...for hydrocarbon steam cracking." Amended claim 11 recites "a KMgPO<sub>4</sub> catalyst...obtained by sintering a KMgPO<sub>4</sub> powder or a KMgPO<sub>4</sub> precursor powder and a metal oxide under 1,000-1,400 °C for 22-26 hours...for hydrocarbon steam cracking." Amended claims 6 and 15 recites similar features of claims 2 and 11 respectively. *Loblich* fails to disclose these features as recited in claims 2, 6, 11 and 15. As correctly pointed out in the Office Action, "*Loblich* fails to disclose a carrier for the composition" as recited in claims 2 and 6, and "*Loblich* fails to disclose using the composition [of the claimed invention] in a hydrocarbon steam cracking process." See *Office Action*, pages 5 and 6, emphasis added. Applicants agree that *Loblich* fails to teach or suggest these features of

claims 2, 6, 11 and 15. In addition, *Loblich* also fails to teach or suggest “sintering KMgPO<sub>4</sub> and the carrier under 1,000-1,400 °C for 22-26 hours” as recited in claim 2 and “sintering a KMgPO<sub>4</sub> powder or a KMgPO<sub>4</sub> precursor powder and a metal oxide under 1,000-1,400 °C for 22-26 hours” as recited in claim 11. Thus, *Loblich* fails to teach or suggest each and every element of claims 2, 6, 11 and 15. Accordingly, claims 2, 6, 11 and 15 are patentable over *Loblich*. Likewise, claims 3, 9, 10, 13 and 17 which variously depend from claims 2, 6, 11 and 15 are also patentable for at least the same reasons as discussed above. Applicants, therefore, respectfully request withdrawal of these rejection.

The Office Action rejects claims 18-21 under 35 U.S.C. §103(a) as being unpatentable over *Loblich* and further in view of U.S. Patent No. 3,852,188 to Dugan et al. (hereinafter “*Dugan*”). Claim 18 has been canceled and thus, the rejection with respect to this claim is now moot. As to the remaining claims, Applicants respectfully traverse this rejection.

Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. *See M.P.E.P. § 2143.01*. The mere fact that references can be combined does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art. *See M.P.E.P. § 2143.01(III)*.

Claims 19-21 depend on newly added claim 22 which recites “A method for producing olefins by steam cracking of hydrocarbons...providing hydrocarbons for steam cracking...the catalyst is KMgPO<sub>4</sub> catalyst supported on a carrier, wherein the catalyst is obtained by sintering KMgPO<sub>4</sub> and the carrier under 1,000-1,400 °C for 22-26 hours, and wherein the concentration of KMgPO<sub>4</sub> in the catalyst is in a range of 0.5-30 wt% based on the total weight of the catalyst...the olefins include ethylene having a range of 31.2 to 31.6%, propylene having a range of 17.1 to 17.2%, and cokes formed on a surface of the catalyst having a range of 0.62 to 3.37%.” As the Office Action admitted, *Loblich* do not disclose the element of “steam cracking of hydrocarbons in the presence of the catalyst” in claim 22. *See Office Action, page 5.* *Loblich* merely discloses that KMgPO<sub>4</sub> is a magnesium-containing fertilizer. *See Loblich, Col 1, lines 19-20, emphasis added.*

In addition, the Office Action improperly relies on *Dugan*. *Dugan* fails to teach or suggest a KMgPO<sub>4</sub> catalyst supported on a carrier as recited in claim 2, but only discloses a “molten media comprising an oxide of phosphorus,...in combination with...an alkali or alkaline earth metal oxide or hydroxide,” such as Na<sub>2</sub>PO<sub>3</sub>. *See Dugan*, Abstract and Col. 5, line 15. Even though the Office Action alleges that *Dugan*’s composition is similar to that of *Loblich*, the combined teaching of *Loblich* and *Dugan* still fail to disclose the concentrations of ethylene, propylene and cokes formed on a surface of the catalyst as recited in claim 22. *See Dugan*, Table 1. Therefore, the combined teaching of *Loblich* and *Dugan* fails to disclose each and every element recited in claim 22 and dependent claims 19-21. In addition, without more, one of ordinary skill in the art could not expect a predictable result from combining the teachings of *Loblich* that only teaches a use of “magnesium-containing fertilizer” and *Dugan* that only discloses different catalyst. Applicants, therefore, respectfully request withdrawal of this rejection.

Regarding newly added claims 23-26, these claims recite similar features as claim 22, “A method for producing olefins by steam cracking of hydrocarbons...providing hydrocarbons for steam cracking...the catalyst is KMgPO<sub>4</sub> catalyst...obtained by sintering a KMgPO<sub>4</sub> powder or a KMgPO<sub>4</sub> precursor powder and a metal oxide under 1,000-1,400 °C for 22-26 hours...the concentration of KMgPO<sub>4</sub> in the catalyst is in a range of 0.5-50 wt% based on the total weight of the catalyst...the olefins include ethylene having a range of 31.2 to 31.6%, propylene having a range of 17.1 to 17.2%, and cokes formed on a surface of the catalyst having a range of 0.62 to 3.37%,” and thus, claim 23 and dependent claims 24-26 are also patentable over *Loblich* and *Dugan* at least for the same reasons as discussed above.

The application is in condition for allowance and early, favorable action is respectfully solicited. If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at (202) 496-7500 to discuss the steps necessary for placing the application in condition for allowance. All correspondence should continue to be sent to the below-listed address.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37

C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911.

Dated: April 12, 2010

Respectfully submitted,

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